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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,402	05/20/2002	Sakae Shibusawa	04730/003001	8989

22511 7590 11/13/2003

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EXAMINER
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ASSOUAD, PATRICK J

ART UNIT	PAPER NUMBER
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2857

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/030,402

Applicant(s)

SHIBUSAWA ET AL.

Examiner

Patrick J Assouad

Art Unit

2857

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 27-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 and 33 is/are rejected.
- 7) ☒ Claim(s) 13-15 is/are objected to.
- 8) ☒ Claim(s) 1-33 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6, 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 27-32 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 9.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Drawings***

4. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See the Brief Description of Fig. 1. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply

to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The disclosure is objected to because of the following informalities: it is replete with grammatical and punctuation and spelling errors; e.g. spectrometer is not spelled "spectromeater" (pg. 31). A thorough check of the entire Specification is requested and appropriate correction is required.

### ***Claim Objections***

6. Claims 13-15 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. See MPEP § 608.01(n).

7. Claims 1-26 and 33 are objected to because of the following informalities: they are replete with grammatical errors; e.g. claim 1, "...into a model determined based on..." or claim 2, "...from a soil of a measurement object...", etc. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2857

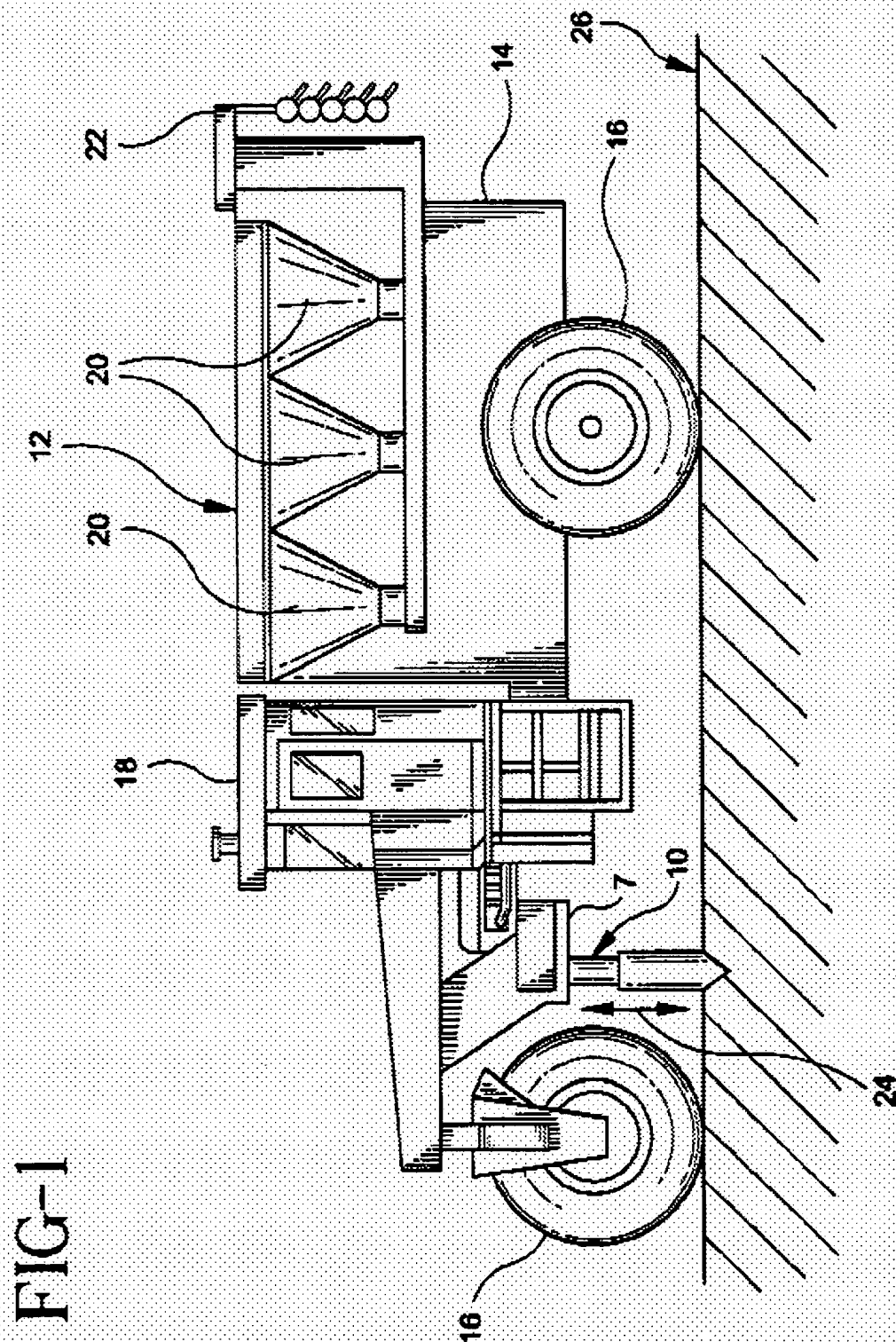
invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

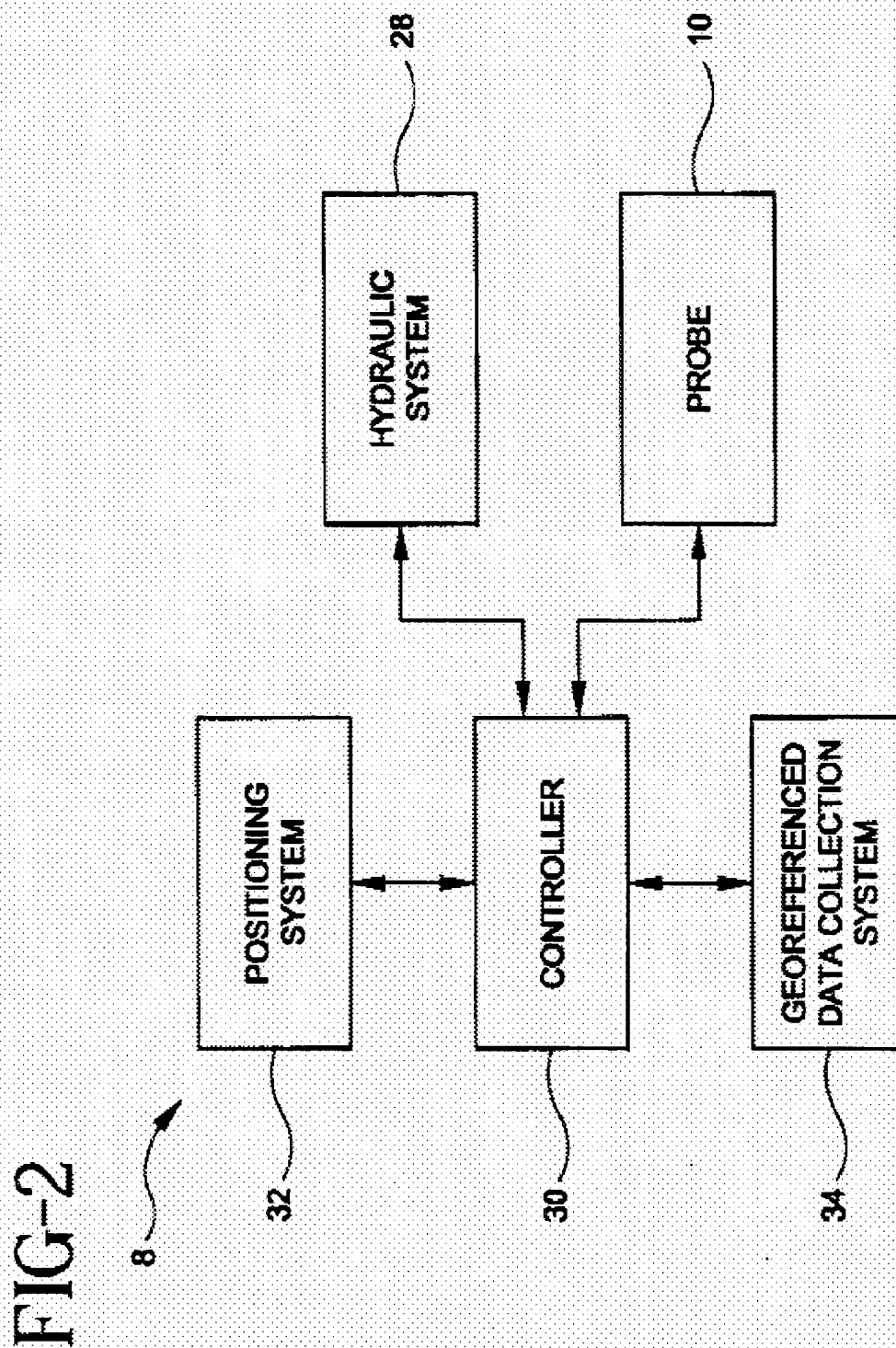
9. Claims 1-26 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Monson et al. ('491) in view of **Bach et al.**, "Modelling and Model Verification of the Spectral Reflectance of Soils Under Varying Moisture Conditions", IEEE, 1994.

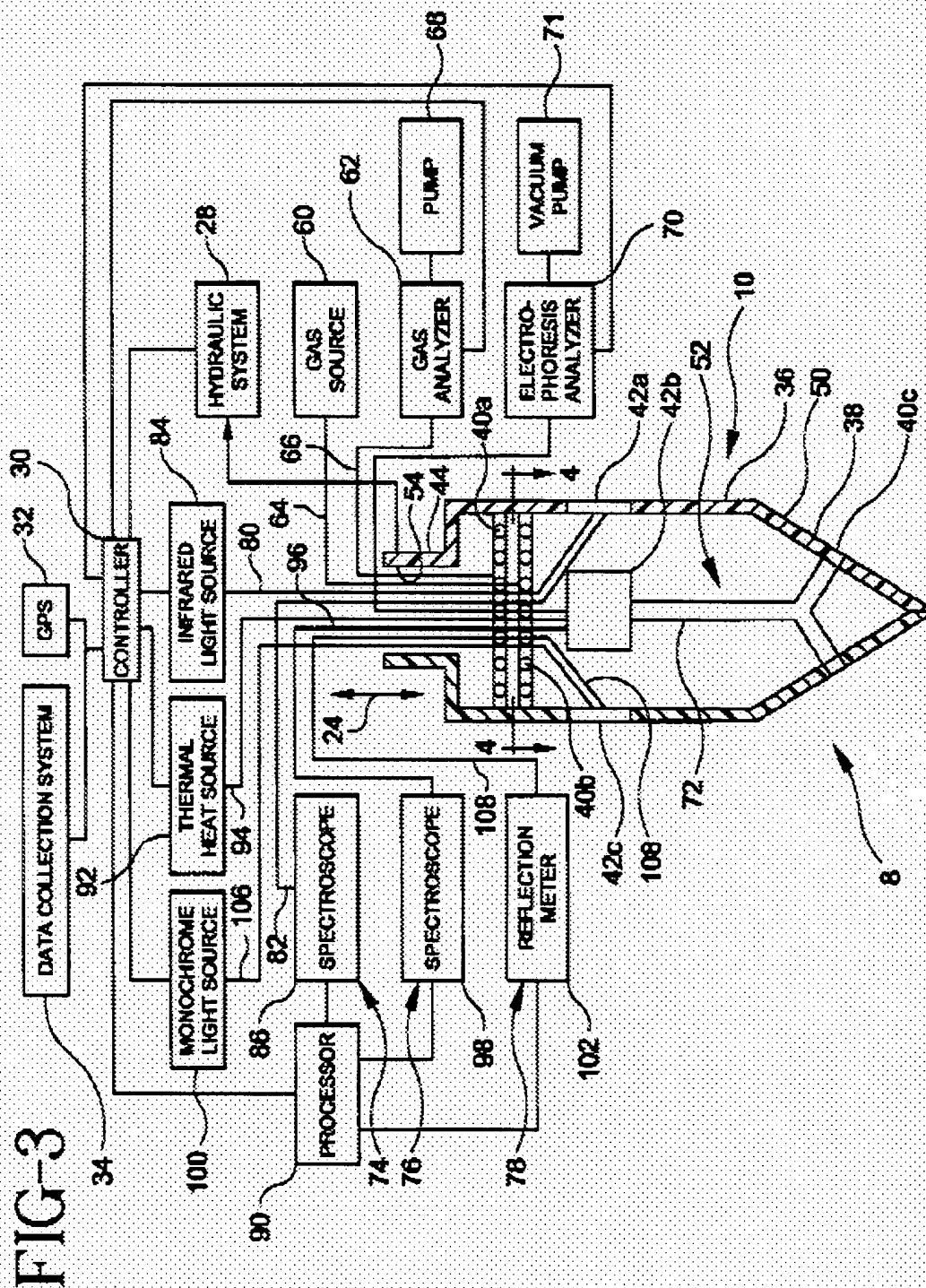
**Note:** Applicant admits in his "Prior Art Technology"-section of his Specification that various optical-based soil measurement systems exist. And in the same section, Applicant admits that it is known that the "degree of moistness of the soil" affects the aforementioned optical-based soil measurements.

10. **Monson et al.** disclose a soil analysis assembly and system. Figs. 1 <sup>thru</sup> and 3 of **Monson et al.** are reproduced below. More particularly, **Monson et al.** disclose:

The present invention relates to a soil analysis system for determining various soil characteristics. Various soil characteristics may include moisture content, organic matter content and the presence of nitrogen phosphate, potassium and other elements. The soil analysis system includes a plurality of testing assemblies for determining soil characteristics. The soil analysis system further includes a soil testing device or probe which is operatively inserted into the soil to support the testing assemblies. Preferably, the soil analysis system is used in cooperation with a positioning system and a data collection system for recording soil characteristic data based upon the geographic location to which the soil characteristic data relates. (Abstract)









Art Unit: 2857

11. The correspondence between the instant claimed invention and that of **Monson et al.** is as follows:

a) preparing storage means for storing soil measurement data correlated with at least the type of soil, information related to the water content contained in the soil, a model for calculating soil properties, and measurement conditions for obtaining measurement data that will be inputted into the model (via a soil measurement assisting device...) is seen in at least Figs. 1-3 and col. 3 of **Monson et al.**:

The data collection system 34 stores data collected from the testing assemblies for possible subsequent analysis and evaluation. The collected data is referenced relative to the field location at which the data is collected. Preferably, the collected data is georeferenced and is stored relative to the geographic latitude and longitude coordinates for the field position at which the data is collected. The controller 30 initiates operation of the hydraulic system 28 for operating the probe 10 at selected locations based upon a predetermined pattern. The positioning system 32 provides position data to the controller 30 for positioning the probe 10 for operation at the selected locations. Data collected from the probe 10 is then stored by the data collection system 34 relative to field location based upon information from the positioning system 32.

b) acquiring at least the type of soil of a measurement site, and information related to the water content contained in the soil (via a soil measuring apparatus main body...) is seen in at least Figs. 1-3 and cols. 3-4 of **Monson et al.**:

In a preferred embodiment, the probe 10 supports various testing assemblies including reflectance testing assemblies, an electrophoresis testing assembly, and a chromatography testing assembly. The chromatology testing, reflectance testing and electrophoresis testing are used to isolate elements or minerals found in the soil and to analyze various soil characteristics.

Various reflectance testing assemblies may be used for the purpose of analyzing moisture content, organic matter content as well as mineral composition of a soil sample. It is generally known that reflectance characteristics of the soil relate to soil texture, moisture content, surface roughness, iron oxide content and organic matter content. Additionally, certain nutrients have unique reflectance characteristics and produce a unique spectral image which allows the content of these nutrients to be analyzed for a particular soil sample. It is desirable to use a combination of tests for

Art Unit: 2857

comparison for evaluating the influence of the various factors affecting reflectance for the purpose of isolating soil characteristics relating to moisture content, organic matter content and nutrient content. The results of the combination of testing assemblies may be used to provide a more accurate determination of soil characteristics. Although it is preferred to use multiple testing assemblies for determining soil characteristics, it should be understood that it is not necessary that each of the testing assemblies described be employed and the invention should only be limited by the claims appended hereto...

...The reflectance testing assembly 74 may be used to determine moisture and nutrient content and includes optical cables 80 and 82, an infrared light source 84, a spectroscope unit 86...

c) then accessing said storage means based on the acquired said type of soil and the information related to said water content, reading out the corresponding measurement conditions and model, and outputting said read out measurement conditions and model is seen in at least Figs. 1-3 and cols. 4 and 8 of **Monson et al.**:

...The reflected light from the soil sample is detected by the spectroscope unit 86 via optical cable 82. The reflectance at various wavelengths is analyzed for the purpose of analyzing different attributes of the soil sample. Different attributes of the soil sample are analyzed via a processing assembly 90 to determine the content of nitrogen, potassium, phosphorus and other elements as will be described herein. The soil characteristic data such as the content of nitrogen, etc. is stored in the data collection system 34 based upon the geographic location of the soil sample as determined by the global positioning system 32.

Additionally, soil moisture data may be used to factor in moisture content for the reflectance data to isolate the influence of moisture content on the reflectance data to isolate the organic matter content. Thus, a relative organic matter content may be derived for the soil sample which may be used for determining proper field treatments for maximum yield or performance.

12. The very minor difference between the instant claimed invention and that of **Monson et al.** lies in the claimed “model” or “modeling” step. **Monson et al.** do calculate soil properties based on a number of inputs; however, they do not explicitly use the term “model” but rather “factor in” (see, e.g. col. 8, line 20) or “determine” or “derive” the influence of moisture content on the collected soil reflectance data.

13. **Bach et al.** teach a “model for the spectral response of soils with varying moisture conditions.” See at least the Abstract. **Bach et al.** also teach the “transfer of the model to imaging spectrometry data.” See col. 1, pg. 2356.

14. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the “model for the spectral response of soils with varying moisture conditions” of **Bach et al.** with the “on-the-go” (col. 2, line 18) soil collection and analyzer of **Monson et al.** because such a combination compensates or perhaps even “eliminates the moisture influence on soil spectra” (Abstract of **Bach et al.**) which then allows an operator to precisely add the proper amount of soil nutrients, fertilizers, etc. which then produces better yield and profitability to the landowner.

### **Conclusion**

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See the attached PTO-892.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J Assouad whose telephone number is 703-305-3811. The examiner can normally be reached on Tuesday-Friday, 6:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on 703-308-1677. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Patrick J Assouad  
Primary Examiner  
Art Unit 2857

pja